

GENE EXPRESSION BY POSITIVE FEEDBACK ACTIVATION OF A CELL TYPE-SPECIFIC PROMOTER

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Abstract

A nucleic acid construct is described which provides cell type-specific expression of a therapeutic transgene. The construct utilizes a cell type-specific promoter which drives expression of the transgene. A positive feedback loop is introduced through the addition of an amplification promoter element operably linked to the therapeutic transgene and by providing, either as part of the same construct, or in a different construct, a transcription activator for activating the amplification promoter element. In one embodiment, the amplification promoter element is a heat shock response element (HSE) and the transcription activator is HSF-1. The construct enables functional targeting of a therapeutic gene while avoiding undesirable effects in non-targeted cells, by combining sufficiently high-level expression to promote a desirable therapeutic outcome with exceptional tissue specificity. A series of promoter elements, constructs, vectors, and therapeutic approaches is presented for gene therapy of tumors such as melanoma and other genetic diseases.

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